

**Instructions: Review the instructions below for an overview of each step that needs to be taken for the economic analysis of a public facility. Then, start at Worksheet A and work through each of the worksheets until you finish the analysis. For a Non-Degradation analysis, go directly to the last tab. The next tab--the 'Summary Worksheet' tab before Worksheet A--is to be filled out after you work through each worksheet in order to summarize your results.**

Summarized below are the steps that need to be taken for the economic analysis of a public facility. Also provided to the right is a flowchart that summarizes those same steps. The complete EPA Guidance for Water Quality Standards can be found at <http://www.epa.gov/waterscience/standards/econworkbook/>

### OVERALL STEPS SUMMARY

### NOTES

Step 1: Verify Project Costs and Calculate the Annual Cost of the Pollution control project

Step 2: Calculate Total Annualized Pollution Control Costs Per Household

Step 3: Calculate and Evaluate the Municipal Preliminary Screener Score-- identifies only entities that can pay for sure

If the public entity passes a significant portion of the pollution control costs along to private facilities or firms, then the review procedures outlined in Chapter 3 of this workbook should also be consulted to determine the impact on the private entities.

Step 4: Apply the Secondary Test - This measurement incorporates a characterization of the community's current financial and socioeconomic well-being

The ability of a community to finance a project may be dependent upon existing financial conditions within that community.

Step 5: Assess where the community falls in The Substantial Impacts Matrix - This matrix evaluates whether or not communities are expected to incur **substantial** economic impacts due to the implementation of the pollution control costs. If the applicant cannot demonstrate substantial impacts, then they will be required to meet existing water quality standards.

The evaluation of substantial impacts resulting from public entity compliance with water quality standards includes two elements, 1) financial impacts to the public entity and 2) current socioeconomic conditions of the community. Governments have the authority to levy taxes and distribute pollution control costs among households and businesses according to the tax base. Similarly, sewage authorities charge for services, and thus can recover pollution control costs through users fees. In both cases, a substantial impact will usually affect the wider community. Whether or not the community faces substantial impacts depends on both the cost of the pollution control and the general financial and economic health of the community.

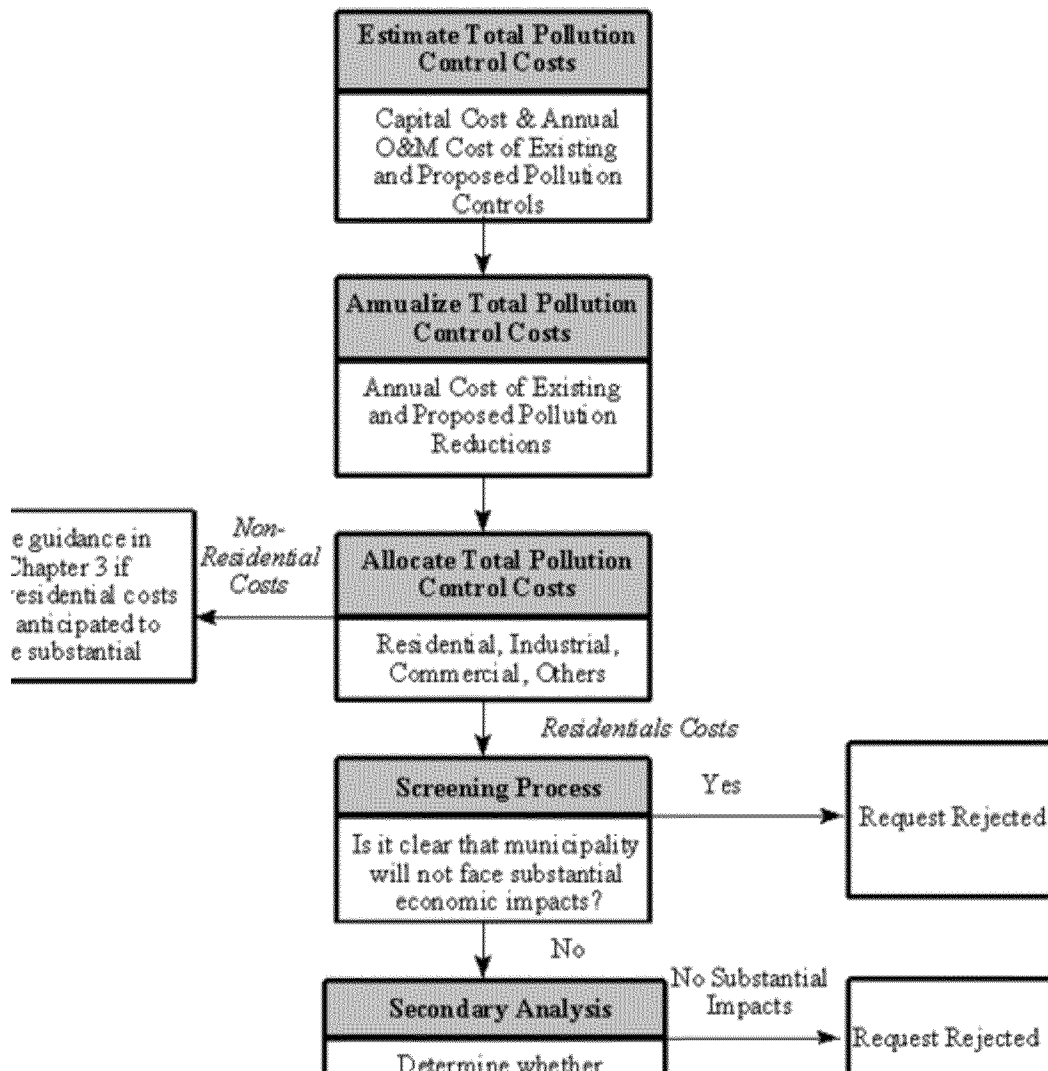
Us  
(  
non-r  
are  
b

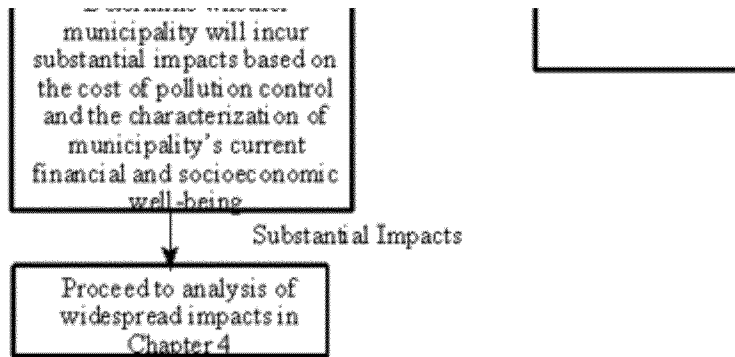
Step 6: If impacts are expected to be substantial, then the applicant goes on to demonstrate whether they are also expected to be **widespread** (Go to "DEQ Widespread Criteria" tab). Estimated *changes* in socio-economic indicators will be used to determine whether widespread impact has occurred

needs to be taken for the  
rough each of the  
directly to the last tab.  
out after you work

a public facility. Also  
e EPA Guidance for Water  
workbook/

**Figure 2-1:  
Measuring Substantial Impacts  
(Public Entities)**





you reach for each step for your analysis. This is help to give a simple overview of what you found out.

---

### **OVERALL STEPS SUMMARY**

the Annual Cost of the Pollution control project	\$4.6 million total in capital costs/\$0.43 million per year in annualized costs
Step 2: Calculate Total Annualized Pollution Control Costs Per Household	\$1,876 per household per year for existing and new costs
Step 3: Calculate and Evaluate the Municipal Preliminary Screener Score-- identifies only entities that can pay for sure	5.83% which is large--There is a need to proceed to the Secondary Test
Step 4: Apply the Secondary Test - This measurement incorporates a characterization of the community's current financial and socioeconomic well-being	The secondary score for Circle came out to be 2.00 or mid-range
Step 5: Assess where the community falls in The Substantial Impacts Matrix - This matrix evaluates whether or not communities are expected to incur <b>substantial</b> economic impacts due to the implementation of the pollution control costs. If the applicant cannot demonstrate substantial impacts, then they will be required to meet existing water quality standards.	Circle cannot afford to pay for the new project according to the matrix so a widespread test is needed.
Step 6: If impacts are expected to be substantial, then the applicant goes on to demonstrate whether they are also expected to be <b>widespread</b> (Go to "DEQ Widespread Criteria" tab).	The Widespread test suggests that Circle would suffer widespread economic and social impacts. This would argue for either a variance, an extended time table, or a different plan to meet standards
Step 7: State the Final Conclusion	Consider granting Circle a variance, an extended time table, or a different plan to meet standards

sults that you reach for each step for

---

## Worksheet A--Pollution Control Project Summary Info

For the purposes of this workbook, a **public entity** refers to any governmental unit that must comply with pollution control requirements in order to meet water quality standards. The most common example is a municipality or sewage authority operating a publicly owned treatment works (POTW) that must be upgraded or expanded. Municipalities, however, may also be required to control other point sources or nonpoint sources of pollution within their jurisdiction.

*Note: The most cost effective project is preferred. Public entities should consider a broad range of discharge management options including pollution prevention, end-of-pipe treatment, and upgrades or additions to existing treatment. Specific types of pollution prevention activities that should be considered are found in Chapter 2 of the EPA Guidance.*

*Whatever the approach, the applicant must demonstrate that the proposed project is the most appropriate means of meeting water quality standards and must document project cost estimates. If at least one of the treatment alternatives that meets water quality standards will not have a substantial financial impact, then the community should not proceed with the analysis presented in the rest of this workbook.*

Current Capacity of the Pollution Control System (skip this for Non-Deg)	0.5 MGD
Design Capacity of the Pollution Control System	0.75 MGD
Current Excess Capacity % (skip this for Non-Deg)	33%
Expected Excess Capacity after Completion of Project %	50%
Projected Groundbreaking Date	Jan-09
Projected Date of Completion	Jan-10

Please describe the pollution control project being proposed and how the project meets water quality standards:

ponds. This would include a sprayer to land apply the water after treatment. This would help Circle meet secondary standards.

Please describe the other pollution control options considered, explaining why each option was rejected. Explain how each alternative would have met water quality standards.

Modifying the lagoons would not be enough to meet the secondary standards.

Is the proposed project the least expensive that can be used to meet the water quality standards goals? If not, give reasons why it is not.

Yes

ment to complement existing lagoon ponds. This would include a sprayer to land apply the water after treatment.  
e meet secondary standards.

s would not be enough to meet the secondary standards.



## Worksheet B-Calculation of Total Annualized Project Costs

*Note: The capital portion of project costs is typically financed over approximately 20 years, by issuing a municipal debt instrument such as a general obligation bond or a revenue bond. Local governments may also finance capital costs using bank loans, state infrastructure loans (revolving funds), or federal subsidized loans (such as those offered by the Farmers Home Administration)*

*If project costs were estimated for some prior year, these costs should be adjusted upward to reflect current year prices using the average annual national Consumer Price Index (CPI) inflation rate for the period*

Capital Cost of Project	\$4,000,000	
Other One-Time Costs of Project (Please List, if any):	\$0	
Sprayers and piping	\$600,000	
	\$0	
	\$0	
	\$0	
<b>Total Capital Costs (Sum column) \$ (1)</b>	<b>\$4,600,000</b>	
Portion of Capital Costs to be Paid for with Grant Monies \$ (2) (Paul)	\$2,000,000	identified in the PER
Capital Costs to be Financed [Calculate: (1) - (2) ] \$ (3)	\$2,600,000	
Type of financing (e.g., G.O. bond, revenue bond, bank loan)		
Interest Rate for Financing (expressed as decimal) (i)	0.06	The interest rate
Time Period of Financing (in years) (n)	20	
Annualization Factor = $i / [(1+i)^n - 1]$ + i (or see Appendix B) (4)	0.08718	depending on funding source. SRF is 125%
Annualized Capital Cost [Calculate: (3) x (4) ] (5)	\$226,680	
<b><u>B. Operating and Maintenance Costs</u></b>		
Annual Costs of Operation and Maintenance (including but not limited to: monitoring, inspection, permitting fees, waste disposal charges, repair, administration and replacement.) (Please list below and state in terms of dollars per year)	\$200,000	
	\$0	
	\$0	
	\$0	
<b>Total Annual O &amp; M Costs (Sum column) \$ (6)</b>	<b>\$200,000</b>	
<b><u>C. Total Annual Cost of Pollution Control Project</u></b>		
Total Annual Cost of Pollution Control Project [ (5) + (6) ] \$ (7)	\$426,680	

g a municipal debt instrument such as a general  
ans, state infrastructure loans (revolving funds), or

current year prices using the average annual national

This should be a realistic amount and should be  
identical to financing plans identified in the PER

te should reflect the type of debt instrument likely to be used.

loan coverage should be included - this applies to  
revenue bonds and varies between 110 to 125%  
depending on funding source. SRF is 125%

funding sources are Rural Development (U.S. Dept. of Ag.) -  
they require 115% coverage - I think - and SRF. We require  
125% coverage on all revenue bonds. You could probably just  
roll this into annual debt, but if you tried to back calculate how  
much a community could afford, it may complicate things.

US bonds are tax-backed. The  
ment (U.S. Dept. of Ag.) - they  
ire 125% coverage on all revenue  
al debt, but if you tried to back  
, it may complicate things.

## Worksheet C-Calculation of Total Annual Pollution Control Costs Per Household

### A. Current Pollution Control Costs:

#### Current sewer rate

Total Annual Cost of Existing Pollution Control \$ (1)	\$55,500
Amount of Existing Costs Paid By Households \$ (2)	\$55,500
Percent of Existing Costs Paid By Households %(3)	100.00%
Number of Households* (4)	257
Annual Cost Per Household [Calculate: (2)/(4) ] \$ (5)	\$216

\* Do not use number of hook-ups.

### B. New Pollution Control Costs

Are households expected to provide revenues for the new pollution control project in the same proportion that they support existing pollution control? (Check a, b or c and continue as directed.)

a) Yes [fill in percent from (3) ] percent.(6a)

b) No, they are expected to pay \_\_\_\_\_ percent.(6b)

c) No, they are expected to pay based on flow. (Continue on Worksheet C, Option A--  
See below)

X

Total Annual Cost of Pollution Control Project [Line (7), Worksheet B] \$ (7)

Proportion of Costs Households Are Expected to Pay [ (6a) or (6b) ] (8)

Amount to Be Paid By Households [Calculate: (7) x (8) ] \$ (9)

Annual Cost per Household [Calculate: (9)/(4) ] \$ (10)

### C. Total Annual Pollution Control Cost Per Household

Total Annual Cost of Pollution Control Per Household (5) + (10) \$ (11)

**Worksheet C: Option A---Flow based (Not Applicable for Circle)**

**Calculation of Total Annual Pollution Control Costs Per Household--Flow based**

#### A. Calculating Project Costs Incurred By Households Based on Flow

Expected Total Usage of Project (eg. MGD for Wastewater Treatment)	0.75	
		(1)
Usage due to Household Use (MGD of Household Wastewater)	0.75	
		(2)
Percent of Usage due to Household Use [Calculate: (2)/(1) ]	100.00%	
		(3)
Total Annual Cost of Pollution Control Project	\$426,680	
		(4)
Industrial Surcharges, if any	\$0	
		(5)
Costs to be Allocated [Calculate: (4) - (5) ]	\$426,680	
		(6)
Amount to Be Paid By Households [Calculate: (3) x (6) ]	\$426,680	
		(7)
Annual Project Cost per Household [Calculate: (7)/Worksheet C, (4) ]	\$1,660	
		(8)

#### C. Total Annual Pollution Control Cost Per Household

Annual Existing Costs Per Household [Worksheet C, (5) ]	\$216	
		(9)
Total Annual Cost of Pollution Control Per Household [ (8) + (9) ]	\$1,876	
		(10)

## Lagoons

(Extrapolating from Census 2000, Susan Ockert)

According to the 2000 census there were 291 households with a population of 644. See <http://www.ceic.mt.gov/C2000/SF32000/SF3places/sfpData/1603014950.pdf>. However the estimated population in Circle in 2006 was 569. With an average household size of 2.21, the number of potential households in 2006 would be 257. Susan Ockert



## Worksheet D-Municipal Preliminary Screener

The Municipal Preliminary Screener indicates quickly whether a public entity will not incur any substantial economic impacts as a result of the proposed pollution control project. The formula is as follows:

Total Annual Pollution Control Cost per Household/Median Household Income X 100

### A. Calculation of The Municipal Preliminary Screener

Total Annual Pollution Control Cost Per Household [Worksheet C, (11) or \$ (1) Worksheet C, Option A (10) ]

\$1,876

Median Household Income\* \$ (2)

(use CPI to update income number to current year)

\$32,162

should be identic

Municipal Preliminary Screener (Calculate: [(1)/(2)] x 100) %(3)

B. Evaluation of The Municipal Preliminary Screener

5.83%

Impact level is (Little, mid-range, large)

**Large**

**Impact** Continue on to secondary test

If the Municipal Preliminary Screener is clearly less than 1.0%, then it is assumed that the cost will not impose an undue financial burden. In this case, it is not necessary to continue with the Secondary Test. Otherwise, it is necessary to continue.

### **Benchmark Comparison:**

**Little Impact**

Less than 1.0%

**Mid-Range Impact**

1.0% - 2.0%

**Indication of no substantial economic impacts**

**Proceed to Secondary Tests**



al to that stated in PER

**Large Impact**  
Greater than 2%

--

## Worksheet E-Data Used in the Secondary Test

community. Use the latest data available for the community or other public jurisdiction being analyzed.

### A. Data Collection

Data	Potential Source
Direct Net Debt--Debt Issued directly by the local jurisdiction (1)	Community Financial Statements
	Town, County or State Assessor's Office \$_____
Overlapping Debt (such as school districts)? (2)	Community Financial Statements
	Town, County or State Assessor's Office \$_____
Market Value of Property within the community or service area (3)	Community Financial Statements
	\$_____
	Town, County or State Assessor's Office
Bond Rating-(if available) (4)	Standard and Poors or Moody's
	_____
Community Unemployment Rate (5)	Source: Montana Department of Labor and Industry, Research and Analysis Bureau, Local Area Unemployment Statistics compiled by CEIC _____%
National Unemployment Rate (6)	Bureau of Labor Statistics 4.7% (6)

<http://www.bls.gov/>  
(202) 606-6392

Community Median Household  
Income for 2006 (7)

\$ \_\_\_\_\_

State Median Household Income  
(8)

\$37,307 for State  
of Montana

Property Tax Collection Rate  
(Indicator of the efficiency of the  
tax collection system--compares  
the actual amount collected from  
property taxes to the amount  
levied) (9)

Community Financial  
Statements

\_\_\_\_\_ %

Property Tax Revenues (10)

Town, County or State  
Assessor's Office

Community Financial  
Statements

\$ \_\_\_\_\_

Town, County or State  
Assessor's Office

Full Market Value of taxable  
property

\$ \_\_\_\_\_

## **B. Calculation of Indicators**

### **1. Overall Net Debt as a Percent of Full Market Value of Taxable Property**

Overall Net Debt (Calculate: (1) +  
(2) ) (11)

\$ \_\_\_\_\_

Overall Net Debt as a Percent of  
Full Market Value of Taxable  
Property (Calculate: [(11)/(3)] x  
100) (12)

\_\_\_\_\_ %

### **2. Property Tax Revenues as a Percent of Full Market Value of Taxable Property**

Property Tax Revenues as a  
Percent of Full Market Value of  
Taxable Property (Calculate:  
[(10)/(3)] x 100) (13)

\_\_\_\_\_ %

ates the community's ability to obtain financing and describes the socioeconomic health of  
ction being analyzed.

Value	Source
\$1,036,000	carol markenson- (406) 485-2524
\$25,156,614	Tax Year 2007 Source: DOR-TPR Mary Craigle
No bond	carol markenson- (406) 485-2524
2.4%	Source: Montana Department of Labor and Industry, Research and Analysis Bureau, Local Area Unemployment Statistics compiled by CEIC
4.7%	<a href="http://www.bls.gov/">http://www.bls.gov/</a>

\$32,162 Susan Ockert-CEIC  
extracted from  
Decision Data  
resources

\$37,307 Susan Ockert-CEIC  
extracted from  
Decision Data  
resources

93.15% carol markenson-  
(406) 485-2524

\$134,510 Tax Year 2007  
Source: DOR-TPR  
Mary Craigle

\$25,156,614 Tax Year 2007  
Source: DOR-TPR  
Mary Craigle

\$1,036,000

4.12%

0.53%

## Worksheet F- Calculating the Secondary Score

The Secondary Test is designed to build upon the characterization of the financial burden identified in the Municipal Preliminary Screener. The Secondary Test indicates the community's ability to obtain financing and describes the socioeconomic health of the

Remember, if one of the debt or socioeconomic indicators is not available, average the two financial management indicators. Please record the scores in the final column. It will sum the scores and compute an average.

**Table 2-1 Secondary Indicators**

		Secondary Indicators			
		Indicator	Weak*	Mid-Range**	Strong***
Debt Indicators		Bond Rating (if available)	Below BBB (S&P)	BBB (S&P)	Above BBB (S&P) or Baa (Moody's)
			Below Baa (Moody's)	Baa (Moody's)	
		Overall Net Debt as Percent of Full Market Value of Taxable Property	Above 5%	2%-5%	Below 2%
SocioEconomic Indicators		Unemployment	More than 1% above National Average	National Average----4.7%	More than 1% below National Average
		Median Household Income	More than 10% below State Median	State Median--\$37,307	More than 10% above State Median
Financial Management Indicators		Property Tax Revenues as a Percent of Full Market Value of Taxable Property	Above 4%	2%-4%	Below 2%
		Property Tax Collection Rate	< 94%	94% - 98%	> 98%

\* Weak is a score of 1 point

\*\* Mid-Range is a score of 2 points

\*\*\* Strong is a score of 3 points

**SUM:**

**AVERAGE:**

<http://www.epa.gov/waterscience/standards/econworkbook/table21.html>

burden than the financial management indicators. Consequently, if one of the debt or socioeconomic indicators is not available, the applicant should average the two financial management indicators and use this averaged value as a single indicator with the remaining indicators. This averaging is necessary so that undue weight is not given to the financial management indicators.

....., and applying .....  
use this averaged value as a single indicator with the remaining indicators. This averaging  
is necessary so that undue weight is not given to the financial management indicators.

indicators and use this averaged value as a single indicator with the remaining indicators.

Circle
Score
N/A
2
3
1
3
1

10

---

2.00

---

of the six indicators, they must appropriate or not available. Since n to the community, the debt and sures of burden than the financial t or socioeconomic indicators is cial management indicators and maining indicators. This averaging ancial management indicators.



.....  
remaining indicators. This averaging  
financial management indicators.

## Assessment of Substantial Impacts Matrix

Table 2-2

Assessment of Substantial Impacts Matrix

	Municipal Preliminary Screener		
	Less than 1%	1% to 2%	Greater than 2%
Secondary score			
Less than 1.5	?	X	X
Between 1.5 and 2.5	\$	?	X
Greater than 2.5	\$	\$	?

Result: necessary in order to determine whether a variance should be given on economic grounds.

**X-Cannot pay due to hardship**

**?-Borderline, undetermined**

**\$-Can pay**

Communities falling into either the "X" or the "?" category should proceed to Chapter 4 to determine whether the impacts are also expected to be widespread.

For communities that fall into the "?" category, if the results of both the Secondary Test and the Municipal Preliminary Screener are borderline, then the community should move into the category closest to it. Take, for example, a community that falls into the center box, with a cumulative assessment score of between 1.5 and 2.5 and a percent of median household income (MHI) between 1.0 and 2.0. If the cumulative score was 1.6 and the percent of MHI was 1.8, then the community should be considered to fall into one of the adjacent "X" categories. If results are not borderline, other factors such as the impact on low or fixed income households, the presence of a failing local industry, and other projects the community would have to forgo in order to comply with water quality standards should be considered. Relevant additional information might include information collected from interviews with municipal financial officers, special reports on industry trends that may affect local employers, and specific financial and economic indicators. The State/discharger should provide any additional information they feel is relevant. This additional information will be critical where the matrix results are not conclusive.

, the matrix indicates that they may have trouble paying for the  
tion control. Thus, a Widespread determination is necessary in  
etermine whether a variance should be given on economic

category should proceed to  
also expected to be widespread.

## DEQ Widespread Criteria - Factors to Consider in Making a Determination of Wide

private) or group of dischargers will have difficulty paying for pollution controls, then an additional analysis must be performed to demonstrate that there will be widespread adverse impacts on the community or surrounding area. There are no economic ratios per se that evaluate socioeconomic impacts. Instead, the relative magnitudes of indicators such as increases in unemployment, losses to the local economy, changes in household income, decreases in tax revenues, indirect effects on other businesses, and increases in sewer fees for remaining private entities should be taken into account when deciding whether impacts could be considered widespread. Since EPA does not have standardized tests and benchmarks with which to measure these impacts, the following guidance is provided as an example of the types of information that should be considered when reviewing impacts on the surrounding community.

pass through to the local economy), consider the baseline economic health of the community, and finally evaluate how the proposed project will affect the socioeconomic well-being of the community. Applicants should feel free to consider additional measures not mentioned here if they judge them to be relevant. Likewise, applicants should not view this guidance as a check list. In all cases, socioeconomic impacts should not be evaluated incrementally, rather, their cumulative effect on the community should be assessed.

Answer as many of the following questions as possible and see the additional instructions below:

INPUT CATEGORY	Weight of Importance	
Define the affected study area or community (1)	Most Important	Town of Circle
Describe the general economic trend in the study area or community--qualitatively or quantitatively. Name the main industry(s) and if any major industries are intending to enter the area or leave the area. What is the current health of that main industry(s)? (2)	Most Important	cycle is happening right now. No new businesses are moving in.
Indicate the general population trend in the area. Is the community growing or shrinking? Specifically state if young people are staying in the area or leaving after they graduate school (3)	Most Important	people are leaving town.
Describe how the economy in general would be affected, if at all, by having to meet requirements. Potential effects, for example, could be changes in median income and/or unemployment. (4)	Most Important	to spread out the new costs to keep rate down at a low level.
How would the unemployment rate in the study area be affected, if at all, by having to comply with numeric nutrient standards? How would this affect the unemployment rate in comparison to the national average which is 4.7% (Source: Montana Department of Labor and Industry, Research and Analysis Bureau, Local Area Unemployment Statistics compiled by CEIC) ? (5)	Important	could only be affected if businesses leave Circle due to higher

Approximately how many more individuals would become unemployed, if any, as a result of having to meet numeric nutrient standards? Are there other ample job opportunities to take up the slack (refer to current unemployment rate in Secondary test)? (6)	Important	ample job opportunities to take up the slack.
What would be the estimated change in Median Household Income, if any, as a result of having to comply with numeric nutrient standards? Describe qualitatively and/or quantitatively. If any change, how would this affect the Median Household Income in comparison to the state median which is \$37,307 (Source: Susan Ockert, CEIC, extracted from Decision Data Resources)? (7)	Important	affected most likely, but household budgets would be squeezed
Percent of households below the poverty line in the affected community and a comparison to the state average of 21.6% (8)	Important	19.8%---€
What would be the estimated change in (8) as a result of having to comply with water quality standards and would that change the comparison to the Montana average? The Montana average percent of households below the poverty line is 21.6% or 80,556 homes out of 372,190 (Source: U.S. Census Bureau, 2006 American Community Survey, POVERTY STATUS OF MONTANA HOUSEHOLDS: 2006, Susan Ockert, CEIC) (9)	Important	close to poverty would experience more financial difficulty as a result.
Expected increase in social services in affected community, if any, if water quality standards have to be met. This can be answered as a change in dollars, a change in percent from current expenditures, or qualitatively if no data exists. (10)	Important	experience the brunt of the impacts.
If applicable, what would be the estimated change in overall net debt of the municipality as a percent of full market value of taxable property as a result of having to meet numeric nutrient standards? (11)	Important	load for such a small town.
What would be the impact on property values within the affected area, if any, from having to meet numeric nutrient standards? (12)	Important	This is unlikely.
What would be the Impact on community and/or commercial development potential in the study area, if any, from having to meet numeric nutrient standards? (13)	Important Probably i	
Is a large percentage of the wastewater treatment plant used by one or a few entities that would be affected by water quality standards? If yes, and these entities closed down as a result of pollution control costs, would significant burden be placed on the rest of the users of that system? (14)	Important	No
Would expenditures on pollution controls to reach attainment have any positive effects on the community? (15)	Important	meeting water quality standards.

<p>If appropriate, would there be any multiplier effects from cost or benefits as a result of having to meeting numeric nutrient criteria? In other words will a dollar lost or gained as a result of the criteria result in the loss or gain of more than one dollar in the study area (e.g. direct and indirect spending)? (16)</p>	<p>Most important</p>	<p>significant in a small town with few businesses.</p>
---	-----------------------	---

<p><b>(For non-deg only).</b> In the case of non-degradation, what is the community's majority opinion on growth and/or the entity coming into the town/region and building a facility? What is the community's majority opinion on degradation of the receiving stream's high quality water? (17)</p>	<p>Most Important (non-deg)</p>	<p>_____</p>
--	---------------------------------	--------------

<p>Is there any additional information that suggests that there are unique conditions in the affected community that should also be considered? (18)</p>	<p>Important</p>	<p>_____</p>
--	------------------	--------------

<p>Based on the criteria you just filled out and on your own judgement, will this community experience widespread impacts? Please describe how you reached this decision.</p>	<p>_____</p>	<p>way to meet standards, or obtain more government grants.</p>
---	--------------	---

---

**ARRIVING AT A CONCLUSION:** The main question to ask is whether widespread economic impacts are likely to occur in the study area as a result of attempting to comply with numeric nutrient standards? (yes/no) The key aspect of a "widespread determination" is that it evaluate change in the socioeconomic conditions that would occur as a result of compliance (EPA 1995).

The analyst should take into account as many of the factors listed above as possible when making a decision on whether impacts are widespread. The decision should be made based on all appropriate factors in a comprehensive manner (rather than as a checklist). The analyst will use his or her judgement on whether all the factors taken together (including some that may not be on this list) constitute widespread impact. Likewise, applicants should not view this guidance as a check list. In all cases, socioeconomic impacts should not be evaluated incrementally; rather, their cumulative effect on the community should be assessed as a whole. Applicants should feel free to use anecdotal information to describe any current community characteristics or anticipated impacts that are not listed in the worksheet.

The analyst may want to weight some of these factors more than others. In some cases, the results from a single category might be sufficient to determine whether widespread impacts will occur, even if other factors suggest differently. These categories are weighted by how important they are relative to the general idea "widespread" is attempting to address, although the analyst can use their own weights if supported by evidence.

In most cases, impacts at the state level will be relatively minor. If not, then impacts are, BY DEFAULT, widespread

There may be secondary impacts from having to meet numeric nutrient standards (not captured by the primary and secondary tests to the community). Secondary impacts, for example, might include depressed economic activity in a community resulting from the loss of purchasing power by persons losing their jobs or leaving the area due to increased user fees.

Reductions in employment caused by compliance with the water quality standards could be widespread if workers have no other employment opportunities nearby. Impacts may also be significant where the public entity(ies) is a primary producer of a particular product or service upon which other nearby businesses or the affected community depend. The impacts of reduced business activities or closure will be far greater in this case than if the products are sold elsewhere.

Potentially, one of the most serious impacts on the affected community's economy is the loss of employment caused by a reduction in business activity or closure. Applicants should also consider whether the lack of alternative employment opportunities may lead to an increased need for social services in the affected community.

## spread Social and Economic Impacts

ious socioeconomic impacts. If the financial tests outlined in Chapter 2 and 3 suggest that a  
s, then an additional analysis must be performed to demonstrate that there will be widespread  
evaluate socioeconomic impacts. Instead, the relative magnitudes of indicators such as increases in  
nues, indirect effects on other businesses, and increases in sewer fees for remaining private entities  
nce EPA does not have standardized tests and benchmarks with which to measure these impacts,  
ered when reviewing impacts on the surrounding community.

ct costs pass through to the local economy), consider the baseline economic health of the  
of the community. Applicants should feel free to consider additional measures not mentioned here if  
In all cases, socioeconomic impacts should not be evaluated incrementally, rather, their cumulative

### The Town of Circle

Circle's economy is on a long-term general decline. It's  
economic output is growing/shrinking at \_\_\_% per year  
which is lower than the state average. Ag, ranching and  
retail are the largest industries, and tend to go through  
boom and bust cycles. A short boom cycle is happening  
right now. No new businesses are moving in.

Circle is losing population. It's population has declined an  
estimated 11.6% from 2000-2006. The majority of its  
young people are leaving town.

The economy, which is already suffering, could be hit hard  
by the higher wastewater rates. It is possible that  
employment could be slightly affected by the rates if some  
people or businesses left. More importantly, household  
budgets would be hit hard. There are not enough  
households in Circle to spread out the new costs to keep  
rate down at a low level.

Unemployment would only be affected if businesses leave  
Circle due to higher wastewater costs--unlikely.



A small chance that a few might be unemployed--probably less than 10. There are not ample job opportunities to take up the slack.

The median household income would not be affected most likely, but household budgets would be squeezed by the new high costs--almost \$2,000 per year.

ow state average  
19.8%---about 10 percent below state average

Probably no effect, because household income is not expected to change. However, some households in poverty or close to poverty would experience more financial difficulty as a result.

There could be a slight increase for those households that experience the brunt of the impacts.

The change would be very large--an increase of about 250% (\$2.6 million dollars) from the current 4.55% up to around 14% which is a high debt load for such a small town.

There could be a drop in property values if enough people leave. This is unlikely.

t trends.

Probably no effect from current trends.

No

They would expand room for future development and population increase while meeting water quality standards.

These could be significant. Households would have less money to spend on other goods, and those effects could be significant in a small town with few businesses.

—

\_\_\_\_\_

what if triggering nondeg is a result of just general growth in the c

—

\_\_\_\_\_

This community would likely experience widespread impacts in terms of having substantial expenses and the resulting multiplier effects on the businesses there. This would be a financial blow on a town struggling to make things work. An argument could be made to find a cheaper way to meet standards, or obtain more government grants.







ommunity?

## Appendix C-Conceptual Measure of Economic Benefits of Clean Water (Optional)

example, in a rural community where the primary source of employment is agriculture, the reduction of fertilizer and pesticide runoff from farms would reduce the cost of treating irrigation water to downstream users. Another example might be an industrial facility discharging its wastewater into a stream that otherwise could be used for recreational cold-water fishing. Treatment or elimination of the industrial wastewater would provide a benefit to recreational fishermen by increasing the variety of fish in the stream. In both cases, the economic benefit is the dollar value associated with the increase in beneficial use or potential use of the waterbody. The types of economic benefits that might be realized will depend on both the characteristics of the polluting entity and characteristics of the affected community, and should be considered on a case by case basis.

to which benefits can be considered in the economic impact analysis. This determination should be coordinated with the EPA Regional Office. A more detailed description of the types of benefits that might be considered is given in Appendix C. This appendix is not intended to provide in-depth guidance on how to estimate economic benefits; rather, it is intended to give States an idea of the types of benefits that might be relevant in a given situation.

between the intrinsic value of the existence of the resource and its value in use by the human population. Use values are further subdivided into direct or indirect uses. Other valuation concepts arise from the uncertainty surrounding future uses and availability of the resource. A classification of these valuation concepts, along with examples, is presented in Table C-1 below.

### C.1 Use Benefits

resource and its uses. A waterbody might be used for recreational activities (such as fishing, boating, swimming, hunting, bird watching), for commercial purposes (such as industrial water supply, irrigation, municipal drinking water, and fish harvesting), or for both. Where recreational activities are created or enhanced due to water quality improvements, the public will benefit in the form of increased recreational opportunities. Similarly, the cost of treating irrigation and drinking water to down stream users could be reduced if pollutant discharges were reduced or eliminated in a particular stretch of river.

non-consumptive uses in that the former excludes other uses of the same resource while the latter does not. For example, water is consumed when it is diverted from a waterbody for irrigation purposes. With non-consumptive uses, however, the resource base remains in the same state before and after use (e.g., swimming). Human health benefits associated with cleaner water could be consumptive (reduced illness from eating finfish or shellfish) or non-consumptive (reduced exposure to infectious diseases while recreating).

its use). For example, commercial fisheries have a market value reflected by the financial value of landings of a particular species. By contrast, no market exists to describe the value individuals receive from swimming. Where market values are available, they should be used to estimate benefits. In the case of water supply, there may or may not be a market for clean water. Some water users may be required to pay for that use as in the case of a farmer paying a regional water board to divert water for irrigation purposes. This will be particularly true in the arid west. By contrast, a manufacturing facility using water for cooling or process water may not pay anything for the right to pump and use water from an adjacent river. For resources with no market value, a number of estimation techniques including the travel cost, estimation from similar markets, and contingent valuation methods have been developed.

while they are conceptually distinct attributes, consumptive use is frequently associated with markets and non-consumptive use is frequently associated with non-market situations. Some resources that are considered market resources, however, may be used non-consumptively. The converse is also true. As an example of the first, a fee may be charged (other than parking) to gain entrance to a state park, however, while a swimmer's use of a lake in the park is not consuming any part of the lake.

indirect use. Examples would be a fishing equipment manufacturer's dependence on healthy fish stocks to induce demand for its products or the dependence of property values on the pristine condition of an adjacent water body. Indirect use is also characterized by the scenic views and water enhanced recreational opportunities (camping, picnicking, birdwatching) associated with the quality of water in a water body. Indirect use benefits such as enhanced property values can be estimated using the hedonic price technique. Care should be taken, however, to not double-count benefits. If property values reflect the proximity to and thus use of water, then the value of the use should not be included separately.

C.2 Intrinsic Benefits

the resource. Intrinsic benefits are represented by the sum of existence and option values. Existence value indicates an individual's (and society's) willingness to pay to maintain an ecological resource such as clean water for its own sake, regardless of any perceived or potential opportunity for that individual to use the water body now or in the future. Contributions of money to save endangered species such as the snail darter demonstrate a willingness to pay for the existence of an environmental amenity despite the fact that the contributors may never use it or even experience it directly.

routinely pay to store or transport something they are not sure they will use in the future because they recognize it would be more costly to recreate the item than to preserve it. In an ecological sense, pristine habitats and wildlife refuges are often preserved under the assumption that plant or animal species which may yield pharmaceutical, genetic, or ecosystem benefits are yet to be discovered. Option value takes on particular importance when proposed development or environmental perturbations are largely irreversible or pollutants are persistent. Intrinsic benefits are difficult to measure due to the level of uncertainty associated with these benefits. The most common approach to estimating intrinsic benefits, however, is the contingent valuation method, which cannot be described in detail within this short overview.

C.3 Summary: Summarize the Water Quality Benefits of this pollution control project

Total valuation of clean water benefits includes all use and existence values as well as option value. The proper framework for estimating the economic benefits associated with clean water consists of 1) determining when damage first occurs or would occur; 2) identifying and quantifying the potential physical/biological damages relative to an appropriate baseline; 3) identifying all affected individuals both due to potential loss of direct or indirect services or uses, and to potential losses attributable to existence values (may include projections for growth in participation rates); 4) estimating the value affected individuals place on clean water prior to potential degradation; and 5) determining the time horizon over which the waterbody would be degraded or restored to some maximum reduced state of service (if ever), and appropriately discounting the stream of potential lost services. If evaluating an improvement in water quality, the procedures are the same except that benefits gained are measured.

Table C-1: Categories of Use Benefits

Direct	Indirect	Intrinsic
Consumptive:	Fishing Equipment Manufacturer	Option Value (access to resource in future)  Existence Value (knowledge that services of resource exist)
Market Benefits	Property Values	
Industrial Water Supply Agricultural Water Supply Municipal Water Supply	Aesthetics (scenic views, water enhanced recreation)	



Commercial Fishing

Non-Market Benefits

Recreational Fishing

Hunting

Industrial Water Supply

Agricultural Water Supply

Municipal Water Supply

Non-Consumptive:

Swimming

Boating

Human Health

water. For example, in a rural community where the  
would reduce the cost of treating irrigation water to  
stream that otherwise could be used for recreational  
recreational fishermen by increasing the variety of fish  
beneficial use or potential use of the waterbody. The  
ing entity and characteristics of the affected

the extent to which benefits can be considered in  
e. A more detailed description of the types of  
depth guidance on how to estimate economic  
a given situation.

made between the intrinsic value of the existence of the  
or indirect uses. Other valuation concepts arise from the  
concepts, along with examples, is presented in Table C-

of the resource and its uses. A waterbody might be used  
purposes (such as industrial water supply, irrigation,  
enhanced due to water quality improvements, the public  
and drinking water to down stream users could be

ished from non-consumptive uses in that the former  
when it is diverted from a waterbody for irrigation  
and after use (e.g., swimming). Human health benefits  
r non-consumptive (reduced exposure to infectious

s case clean water) can be considered market or non-  
mercial fisheries have a market value reflected by the  
individuals receive from swimming. Where market values  
y not be a market for clean water. Some water users may  
r for irrigation purposes. This will be particularly true in the  
anything for the right to pump and use water from an  
travel cost, estimation from similar markets, and contingent

and non-consumptive use is frequently associated with  
l non-consumptively. The converse is also true. As an  
ver, while a swimmer's use of a lake in the park is not

fit from indirect use. Examples would be a fishing  
e dependence of property values on the pristine condition  
l recreational opportunities (camping, picnicking,  
nced property values can be estimated using the hedonic  
ct the proximity to and thus use of water, then the value of

ent use of the resource. Intrinsic benefits are represented  
willingness to pay to maintain an ecological resource such  
to use the water body now or in the future. Contributions  
the existence of an environmental amenity despite the fact

water in known or as yet unknown ways. In a sense it is a  
ing they are not sure they will use in the future because  
, pristine habitats and wildlife refuges are often preserved  
stem benefits are yet to be discovered. Option value takes  
versible or pollutants are persistent. Intrinsic benefits are  
approach to estimating intrinsic benefits, however, is the

---

**value. The proper framework for estimating the  
rst occurs or would occur; 2) identifying and  
identifying all affected individuals both due to  
existence values (may include projections for  
water prior to potential degradation; and 5)  
me maximum reduced state of service (if ever),  
ement in water quality, the procedures are the  
d.**



## Non-Degradation for a Public Entity

allows the public to make decisions about important environmental actions. Where the State intends to provide for development, it may decide that some lowering of water quality in "high-quality waters" is necessary to accommodate important economic or social development. Any such reduction in water quality, however, must protect existing uses fully and must satisfy the requirements for intergovernmental coordination and public participation.

To determine if water quality can be lowered for a new public development, the same tests are used as in this work

Question:

(1) Will the pollution controls needed to maintain the high-quality water interfere with the proposed public development? (Analogous to secondary test for substantial effects)

(2) Is the proposed public development important economically and socially to the study area? (Analogous to Wide

The tests used to demonstrate interference and importance are the same as those used to demonstrate substantial and widespread. The difference is, however, that an antidegradation review considers situations that would improve the current economic condition.

If the answer is no to either 1 or 2 above, then the analysis is over---no degradation of water quality is necessary. by the pollution controls necessary to prevent degradation *is* an *important* economic and social development.

To answer question (1), please complete Worksheets A through E, and the Substantial Impacts Matrix.

To answer question (2), please complete Worksheet M and the DEQ Widespread Criteria worksheet.

Complete the summary information on tab X.

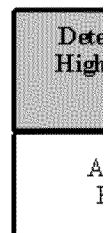
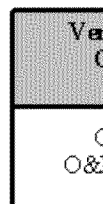
An antidegradation review must determine that the lowering of water quality is necessary in order to accommodate social development in the area in which the waters are located.

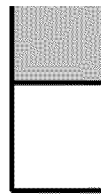
While the terminology is different, the tests to determine substantial and widespread economic impacts (used when removing a use or granting a variance) are basically the same as those used to determine if there might be interference with an important social and economic development (antidegradation). As such, antidegradation analysis is the mirror image of the analyses described in Chapters 2, 3 and 4. Variances and downgrades refer to situations where additional treatment needed to meet standards may result in worsening economic conditions; while antidegradation refers to situations where lowering water quality may result in improved social and economic conditions.

When performing an antidegradation review, the first question is whether the pollution controls needed to maintain the high-quality water will interfere with the proposed development. If not, then the lowering of water quality is not warranted. If, on the other hand, the pollution controls will interfere with development, then the review must show that the development would be an important economic and social one. These two steps rely on the same tests as the determination of substantial and widespread impacts.

The analytic approach presented here can be used for a variety of public-sector and private sector entities, including POTWs, commercial, industrial, residential and recreational land uses, and for point and nonpoint sources of pollution.

Anti





Qu  
red  
anc

policy that allows the public to make decisions about  
side that some lowering of water quality in "high-quality  
action in water quality, however, must protect existing  
ipation.

sheet. However, the question is slightly different.

d public development? (Analogous to secondary test

spread Impacts Test)

ferred with by the pollution controls necessary to

Matrix.  
heet.

important economic or

**Figure 5-1:  
degradation Review**

